Filed under
Fitzpatrick H.M.

TREE TALK

CAB INTERNATIONAL
MYCOLOGICAL INSTITUTE
FITZPATRICK
H.M.
2 C MAY 1955

AUTUMN NUMBER
1926 25 Cents

SUGGESTION

Enclosed find $1.00 for one year's subscription to TREE TALK.

Name _____

Address _____

TREE TALK

A Periodical devoted to the planting, care and treatment of trees and landscape forestry in general

Published quarterly by
THE TREE TALK PUBLISHING COMPANY
STAMFORD, CONN.

Subscription price one dollar a year. Advertising rates on application.

Address all communications to TREE TALK, Stamford, Conn.

VOL. 8 AUTUMN NUMBER, 1926 No. 1

Contents

Three Patriarchs		Page 2
Editorial		3
Mushrooms on Trees	*By H. M. Fitzpatrick*	4–7
The Pines	*By Leslie Burroughs*	8
White Pine and White Pine Blister Rust	*By H. H. York*	8–10
European Hornet Girdling Shrubs	*By Dr. E. P. Felt*	11–12
Berry Bearing Trees and Shrubs	*By Henry Wild*	13–14
What's Wrong With This Picture?		15
Men and Trees	*By F. A. Bartlett*	16–18
The Japanese Beetle		19
Indian Trail Trees	*By W. M. Bagnall*	20–22
Book Review		23
The Third Annual Shade Tree Convention	*By C. C. Lawrence*	24–26
Our "Dressed Up" Trees		26
Timely Hints		27
The Care of Locust Trees	*By C. F. G. Carpenter*	28–29
Tree Surgery that Causes Admiration		30
Pecan Scab		31
Plants Valuable because of the Autumn Coloration of Leaves		32
Good Books About Trees		33

Three Patriarchs.

Editor's Column

WITH this number we celebrate our thirteenth birthday, and it may truly be called a celebration number for the variety of offerings with the names of the contributors is especially noteworthy. Prof. H. M. Fitzpatrick, the eminent mycologist of Cornell University, has written so the layman can understand about "Mushrooms on Trees." Dr. H. H. York, foremost authority on white pine blister rust has described its ravages as affecting the king of all lumbers, the white pine. Dr. E. P. Felt, New York State Entomologist has come through with a noteworthy contribution to science in a brief note describing the ravages of the European hornet. Henry Wild, eminent horticulturist, speaks with authority on "Berry Bearing Trees and Shrubs." Mr. Bartlett gives us some new startling thoughts in relation to wound dressings. Mr. W. M. Bagnall, Chicago Associate of the Bartlett Company, opens up a new field for thought with his "Indian Trail Trees." Your editor describes the Third Annual Shade Tree Convention at Philadelphia attended by most of the notables in the tree surgery field. Mr. C. F. G. Carpenter is an old writer in a new field, this being his first contribution to TREE TALK. Some up to the minute information is given on fungus diseases, such as maple wilt and pecan scab and on the insect enemies, the Japanese and Asiatic beetles.

Mushrooms on Trees

By H. M. Fitzpatrick

Dr. Fitzpatrick is Professor of Mycology at Cornell University and ranks as one of the foremost mycologists in the country. His article on "Mushrooms on Trees" is particularly valuable information.

The majority of mushrooms grow on the ground, and obtain their nourishment from the humus or leaf mold. Others spring up on decaying twigs, branches, cones, logs, stumps, railroad ties, and structural timber. A relatively small number are found on the trunks and branches of living trees. It is with this last group that the readers of Tree Talk are doubtless chiefly concerned.

The terms mushroom and toadstool are usually applied by the layman to designate respectively edible and poisonous species. This distinction is not made by the scientist, the two words being used interchangeably as synonyms, though mushroom is usually preferred. The common mush-

Fig. 1. Fruit body of field mushrooms, Agaricus campestris. Natural size.
Photo by W. R. Fischer.

rooms have a characteristic umbrella shape. The handle is termed the stalk or stipe, the expanded top the cap or pileus. When the mushroom grows out from the side of a tree the stipe is sometimes lacking, the pileus being attached laterally. On the under surface of the pileus and radiating as the spokes of a wheel are numerous, prominent, flat, knife-blade like plates called gills. On the surface of these gills are produced in countless numbers microscopic bodies called spores. These little bodies are analogous to seeds. They ripen, fall away as dust, and are blown about by the wind. Falling on a suitable substratum they germinate in wet weather, and develop directly into long slender threads termed mycelium. These threads constitute the vegetative part of the fungus, and obtain from the substratum the food necessary for growth. The mycelium permeates the substratum in all directions, being profusely developed and abundantly branched. The umbrella developed above the substratum obtains all of its nourishment from the mycelium, and is thus not the whole plant as we may have supposed but merely the fruit-body. In the growing of the common, edible, field mushroom *(Agaricus campestris)* for the market, blocks of richly manured soil densely packed with the threads of the mycelium are used to propogate the fungus directly from one bed to another and are sold by the grower under the name of spawn.

Those species of mushrooms which occur on trees develop their fruit-bodies at the surface in the open air only after the mycelium has existed for a long period of time in the wood. The spores are unable to gain access through the unwounded bark, but once having reached the wood they germinate and the mycelium which develops may advance throughout the tree even after the wound has been completely healed over and lost to sight. This fact explains the necessity for great care in pruning and in the disinfection of all cut or wounded surfaces. Many months after the original infection the fungus forms its fruit-bodies at whatever point egress to the outside of the tree is possible. A new wound many feet from the point of entrance may provide this. The observer is then surprised to see that fruit-bodies of large size are developed almost over night from an apparently healthy tree. Of course examination will reveal in all cases that the interior of the tree is already badly decayed.

Fig. 2. Fruit bodies of the oyster mushroom, Pleurotus ostreatus.
Photo by C. D. Learn.

Mushrooms belong to the large group of low plant life known as fungi. To this group belong also the yeasts, the rusts, smuts, and mildews of

cultivated crops and wild plants, the puff-balls, the stink-horns, the blue molds of the cheese industry, the morels, the bracket fungi of trees, and many other diverse forms, all characterized by the absence of the green coloring matter present in higher plants. Many fungi cause disease in plants, insects, higher animals, and man. Fungi of many different sorts occur on trees. Even the unobserving cannot avoid seeing many of them. The majority of these forms gain a foothold on the tree after its death or in dead portions of a living tree. Such fungi are termed saprophytes. A relatively small number of species attack the living wood. These are called parasites.

The most serious parasites of trees are the bracket fungi known as polypores. These forms are close relatives of the mushrooms. They differ from them chiefly in that the under surface of the fruit-body is covered with small pores instead of gills. These pores are the mouths of tubes in which the spores are developed. Most of the literature dealing with wood decay deals with these forms. Nevertheless a number of species of the true gill-bearing mushrooms are serious parasites of trees.

The honey agaric *(Armillaria mellea)* progresses in the soil from tree to tree attacking the roots. It is one of the few species known to be able to attack healthy roots. Its mycelium unites to form heavy black cords called rhizomorphs. These are often found beneath the bark, and they aid in the identification of the species. After entrance the mycelium spreads upward through the roots killing the whole tree.

The edible oyster agaric *(Pleurotus ostreatus)* illustrated in the accompanying photograph is a less virulent parasite. Ability to identify the many different species of mushrooms which are found growing on trees, and to distinguish between dangerous parasites and harmless saprophytes comes only after considerable study. There are several good books on mushrooms, and several specialists in the country who know the species on sight are willing to name them for the amateur.

MAPLE WILT

Maple Wilt, which was first reported in this country eleven years ago, is now known in spots in the region extending from North Carolina and Tennessee to Canada and westward to Wisconsin. The present known maple hosts are silver maple, boxelder, Japanese red maple, Norway maple, sycamore maple, red maple, and sugar maple.

Some of the symptoms of the disease, such as sudden wilting, thin foliage, slime flux, and dead streaks in the trunk, occur on only part of the wilt-infected maples, but the sapwood of all infected parts contains characteristic green streaks.

The fungus frequently gains entrance to healthy trees through wounds. It can be carried from tree to tree by insects and by pruning tools, though there are various other ways for its spread. The rate of spread of the wilt varies greatly. The suggested treatment consists of sanitary measures, such as cutting out and burning infected parts and the protection of wounds.

THE PINES

When fears and sorrows throng the tired brain,
And furies rage within the tortured head
Despise not Nature's cure, nor groan abed;
But seek the forest trail, the grassy lane,
And deeply breathe the sea-air once again,
Where ripening cones are clinging overhead
'Midst rugged branches—lighter grows the tread
In its new-gained freedom. No refrain
Is sweeter than the night-wind's lay among
The fragrant pines, no choir's swelling voice
Is deeper, more exalting than the song
Of roaring surf, or distant thunder's noise,
Heard in the forest evergreen—while long
And loud in primal tones they do rejoice.

For many a time when thoughts oppressed, and sights
Intolerable became, and vexed the eyes,
And melodies but drifted to the skies
In melancholy tones—I sought the heights
Of Solitude, where the tall pine invites
The wanderer to mount the craggy rise;
And far below the restless ocean lies,
Reflecting sunny days and starlit nights.
Here health is found in rich and plenteous store,
Here Beauty dwells in silent majesty;
And white-winged Fancy flies the winds before.
Man casts away his fetters, and is free
To live the happy life forevermore,
Where river flows into the endless sea.

—Leslie Burroughs.

White Pine and White Pine Blister Rust

By H. H. York, Forest Pathologist
Conservation Commission, Albany, N. Y.

Dr. York is the foremost authority in this country on White Pine Blister Rust, and his contribution is timely information about an imported plant pest that threatens our leading timber crop.

The white pines are among our most graceful conifers. The picturesqueness of outline of the Eastern White Pine in the landscapes of the Northeastern United States is admired and cherished by many people. This species has not only built many homes, but its stateliness and beauty add to the dignity of many typical American estates. It is the white pine tree and where properly placed is highly desirable for ornamental planting. The white pines are distinguished from all other pines in that their needles or leaves are in clusters of five.

As is true with other plants the white pine is subject to fungous diseases, the most dangerous of which is the White Pine Blister Rust. Like most of our serious plant diseases White Pine Rust is a foreign invader.

When the vital need for the maintenance of an adequate supply of timber began to become a conscious fact in our Country, there came the realization that if we are to grow sufficient timber to meet the requirements of our future citizens, land owners must plant trees and care for them the same as any other crop of the land. Since timber is a slow growing crop at best the thought was to plant the most rapidly growing tree as well as the one best suited to our needs. The Eastern White Pine is that tree. It has been called the tree of a thousand uses.

Thirty years ago American Nurserymen were not producing White Pine trees in sufficient quantities to meet the growing demands for this species for ornamental planting. Owing to a lack of knowledge of nursery methods, seedling white pine trees were not grown as economically here in American soil as could be done in Europe. With the increasing demand for seedling Eastern White Pine trees, seeds of this species were collected here in our Country, sent to Europe, principally to France and Germany, where millions of seedlings of Eastern White Pine were grown and imported to America. White Pine Blister Rust had been present for years throughout northern and central Europe. This disease came into our Country unrecognized on thousands of seedling white pine imported from France and Germany. These trees became generally distributed throughout the entire Northeast and even as far westward as British Columbia. Thus White Pine Blister Rust, which is as deadly to White pine trees as fire, became established in these sections of America for all time to come.

White Pine Blister Rust is a deceptive disease. It is peculiar in that

Early spring stage of Blister Rust on a side branch of a White Pine Tree. Some of the blisters have broken open. The fresh blisters are orange yellow. The spores in these blisters transmit blister rust to currant and gooseberry bushes.

like many fungous diseases two host plants are required for it to complete its full cycle of development. These host plants are only White pine trees and currant and gooseberry bushes.

The Blister Rust fungus is a plant and like other plants it reproduces by means of seeds. The seeds of fungi are called spores. Blister Rust spreads from currant and gooseberry bushes by means of spores to White pine trees from about July 1 until the leaves of these bushes fall in Autumn. Blister Rust enters a White pine almost entirely through the needles, leaves, of the tree. When a Blister Rust spore falls upon a needle under the proper conditions of moisture and temperature it germinates, sending out a very tiny tube which enters the needle through one of the tiny pores in its epidermis. Then this germ tube, as it is known, begins to branch and grow down thru the needle into the bark of the twig. It continues to branch, forming a multitude of very delicate thread-like tubes which spread out in the living tissues of the inner bark. The diseased bark becomes swollen and often orange yellow in color. These are some of the most characteristic of the early symptoms of Blister Rust on White pine trees. Thus White Pine Blister Rust in White pine trees is a bark disease. The Blister Rust fungi steals its food from the living tissues of the bark, finally killing them. The disease spreads from the twig into the branch, killing the bark as it goes. From the branch it enters the trunk of the tree and when the bark is entirely killed around

the trunk the flow of sap in the bark, which is vital to the tree, stops and the tree dies. Blister Rust is sure death to trees of all ages. It shows a decided preference for the more vigorous and healthy trees.

About three years after the Blister Rust plant enters the needle, orange yellow blisters about the size of an ordinary navy bean, push through portions of the diseased bark from the latter part of April to the first of June. Fig. 1. These blisters are the fruiting bodies of the Blister Rust plant. They are sometimes called the early spring stage and are filled with dry dust-like spores. These spores may be blown 150 miles or more. They will not transmit Blister Rust to White pine trees. But if they fall on the leaves of currant and gooseberry bushes, under proper conditions for growth, they germinate, producing tiny germ tubes, which make their way into the leaves. In about ten to fourteen days tiny yellow or orange yellow pustules push through the epidermis on the underside of the leaf. These pustules are filled with spores which spread the disease from leaf to leaf and bush to bush. This is the early summer stage of Blister Rust because it is most abundant during late spring and early summer. The spores of the early summer stage spread blister rust only on currant and gooseberry bushes. After the spores are gone, the diseased bark, where the blisters were produced dies, shrinks and often cracks open.

Beginning about the first week of July another stage of blister rust appears on the underside of the leaves of currant and gooseberry bushes. It originates from the early summer state. The fruiting bodies of this stage are tiny hair shaped columns of spores which serve only to spread blister rust from currant and gooseberry bushes to white pine trees.

The seasonal sequence of the fruiting stages and spread of blister rust are: From the early part of April to the first of June, the early spring stage on the white pine. The spores of which spread the disease only to currant and gooseberry bushes. Early summer stage on the underside of the leaves of currant and gooseberry bushes. Most abundant from the latter half of May to the middle of July and spreads only on these bushes. The late summer stage on the leaves of these bushes from July till the leaves fall and spreads blister rust only from them to white pine trees.

The spread of blister rust from currant and gooseberry bushes to White pine trees can be absolutely stopped by pulling up these bushes within 900 feet of the white pine trees and destroying them. Care must be taken to remove the larger parts of the roots to prevent sprouting.

The cultivated black currant and the flowering currants, Ribes odoratum and R. aurum which are also black currants, are especially susceptible to blister rust. Owing to the fact that these bushes may produce white pine infecting spores in greater abundance than any other species of Ribes they may often spread the disease farther than 900 feet. Because of these facts it is against the law to grow black currants in New York and some other states.

Many persons are apt to confuse White Pine Blister Rust with what is known as the White Pine Aphis, which is an insect. This organism often occurs in white cottony masses on the bark of the tree. The blister stage of the Blister Rust on the white pine is orange yellow in color and occurs from the latter part of April to the first of June.

European Hornet Girdling Shrubs

By Dr. E. P. Felt

Dr. Felt is New York State's Entomologist and author of "Manual of Insects Affecting Park and Woodland Trees." The European Hornet is one of the newer pests and deserving of special attention.

Some 30 years ago a giant, hairy, black hornet with dark yellowish-orange markings and about an inch long was first observed in the vicinity of New York City. It has spread gradually and is now rather generally distributed within 100 miles or thereabouts of New York City and occasionally attracts notice because of its stripping the bark from the young stems of a variety of trees and shrubs, such as alder, linden, lilac, various willows, poplar, horse chestnut, larch, oak and most recently of all, rhododendron.

The injury to living twigs is usually very irregular and is generally done early in June or July. It is caused by the hornets gnawing away the bark down to the sapwood on twigs mostly half an inch in diameter or less. The barked area may be largely on one side of a twig and extend for 10 or 12 inches or it may be much more irregular and girdle the twig in several places. In the latter instance the portion beyond the affected part ultimately dies and in any event there is more or less disfiguration. This bark or woody tissue is doubtless used in the construction of the paper nests, though some European authorities consider that the main purpose of the insect is to obtain sap flowing from the wounds.

Recent and old work of European hornet on rhododendron, ½ natural size.

An unusual type of injury by this insect has just come to notice. The recent damage is very suggestive of light transverse saw-cuts just grazing the sapwood, with a length from approximately half an inch to an inch and a half or possibly two inches. There are a series of these, ¼ to ½ an inch apart, girdling the stem of a rhododendron some two inches in diameter and above this recent injury, evidently the work of the last

Old work of European hornet, two and perhaps three years standing. April, 1926.

season, there is older damage indicated by transverse swollen ridges of corky tissue and several large exposed areas of dead wood.

Ordinarily, this European hornet is seriously injurious only as it attacks highly valued ornamentals, as in the case just cited. The insect nests in hollow trees where it may build a series of combs occupying the entire cavity, entrance to which is usually gained through a small opening. The hornets also construct underground nests which are entered by a broad gallery turned up slightly at each extremity and giving access to the lower portion of the nest. The "paper" used in the construction of the nest is considerably darker than that of our smaller white-faced hornet, a very common species which constructs its oval, free-hanging nests in sheltered places about buildings or depending from the smaller branches of trees, some of these nests being as much as two feet in length.

Protection from this insect can be secured either by searching out and destroying the hornets in their nests by the use of burning sulphur, carbon disulphide or the newer and possibly more effective calcium cyanide. Treatment with these materials should be in the early evening when the insects are in the nest, care being exercised to prevent the escape of the hornets, with possible serious results from numerous very painful stings. Spraying the trunks and branches with a poison, particularly those with a rough bark, such as rhododendron, would very likely afford a large degree of protection. Arsenate of lead should be used at the rate of at least 4 pounds to 50 gallons of water.

Red cedars are known to carry the apple rust disease through the winter. If such trees are near an orchard they ought to be destroyed to reduce the danger as much as possible.

All blighted limbs on apple and pear trees should be cut off in the winter time. The dreaded blight organism lives over in such tissue.

Autumn, 1926

Berry Bearing Trees and Shrubs

By Henry Wild

Berry-bearing Trees and Shrubs will command our attention these fall months and Mr. Wild has ably described a few of the more important.

There is a lure about the Spring Catalogs and Garden Guides that awakens the desire to get out doors. The pleasure of anticipation in what we are going to plant always lends an added zest to the preparatory lists we make up on their arrival. The average collection of flowering Trees and Shrubs are easily decided on, most of these are Spring flowering and generally well known.

It is on these later flowering and berry bearing types the Editor has requested me to write, and when one considers the variety of berry bearing Trees and Shrubs there are to select from that brightens up the landscape during the early fall and winter, a few brief notes on some of the most interesting types are called to the attention of readers of *Tree Talk*.

Amongst the first to show their fruit or berries are the Loniceras or Bush Honeysuckle. The variety Lonicera Morrowi is one of the earliest, by the time most of the shrubs are through flowering this variety is at its best, its wine red berries are borne freely. Lonicera Mackii is perhaps the most admired of the species, flowering late and carrying its bright berries well into winter. The robins always have their final feast with us on this variety.

The Viburnums embrace a greater variety of color showing their berries well into winter. Vib. cassinoides bears blue fruit and fine Autumn foliage. Vib. lentago bluish black fruit Vib. opulus (the Cranberry Bush) carries pendelus sprays of red berries that appear transparent against the setting sun. Perhaps the least known and in the opinion of the writer the best, is Vib. dilitatum. This variety bears bright upright clusters of berries and wonderful foliage, it is ideal for both single specimens and mass effects.

For a combination try our native Holly Ilex Verticillata or Black Alder with Symphoricarpus racemosus, the snow berry. The latter is the old fashioned white berry we used to pop in the garden as children. This variety is a splendid foil in the hardy border with pink Phlox. In a moonlight garden it is beautiful. The coral berry or Indian Currant makes a good companion for the white form.

There are several forms of Bush Euonymus well adapted for small grounds. Euonymus alatus the cork bark variety, the foliage of which turns a brilliant red in Autumn and displays orange colored berries. Euonymus bungeanus known as the Burning Bush and Euonymus latifolius with conspicuous red berries are excellent as individual specimens.

Amelanchier Canadensis, the Shad Bush besides being an early flowering bush carries edible blue fruit. The white Kerria Rhodotypus bears a profusion of coffee colored berries all winter. This bush makes an ideal

hedge. Cornus paniculata and stolonifera both bear white fruit, while the variety Amomum makes a contrast in blue. These varieties are all excellent for the colored forms of bark, if cut back every Spring the color of the stems are greatly improved. For something unusual try Photina Villosa, its flowers resemble English Hawthorn and are followed by a profusion of scarlet berries.

Our native Hawthorns and Dogwoods lends a glorious touch of color to a natural planting and supply food for migrating birds. The Crab Apples are wonderful in variety of flower, their fruit hanging on after hard frosts and are free lunch counters for the Blue Jays. The Mountain Ash Sorbus Acuparia always attracts attention, ideal as a single specimen for the lawn or grouped with Evergreens. This Tree is sometimes attacked by a borer. Have your tree doctor look them over if this appears.

Amongst ideal types of berry bearing bushes to use with Evergreens are the Cottoneasters. The variety Horizontalis prostrate in form is a study when the ground is covered with snow. There are also upright types varying in their coloring of berries, all are good. Callicarpa purpurea is a gem amongst the medium sized shrubs, this is a slender growing bush covered with sprays of lavender colored berries.

Regels Privet, a drooping form, holds its bluish-black fruit all winter; try this as a single specimen or for a hedge. Several attractive climbers are a welcome addition to the berry bearing class. The Torquoise berry vine Ampelopsis heterophylla carries a wealth of blue berries and is a splendid vine in every way. Euonymus vegetus, an evergreen climber, is an acquisition to our list of climbers, this will grow well on the south side of a residence where English Ivy would turn brown. It carries berries the same color and similar to our native Bittersweet. The latter may be planted to advantage on old walls, banks, and to veil trees that are past their best.

One of our best single flowering Roses noted for its strong growth foliage and freedom in flowering, the American Pillar, carries its bright seed pods all winter. Rosa Rugosa is perhaps the best of the Bush Roses for its display of fruit, while Rosa Wich. carries smaller seed pods and is valuable for covering terraces or steep banks. The Matrimony Vine Lycium chinensis, bears its berries profusely and is splendid for dry hillsides or to overhang walls.

The Berberis are all attractive and well known. The Pryus lend variety and are relished by the birds. Last but not least for winter effect plant a few bushes of Witch Hazel Hammamellis Virginiana this Spring, its cheery yellow blossoms brave the frosts and snows and lend a touch of cheer when the garden has gone to sleep. Space will not allow any more for the present. Try some of the varieties mentioned and brighten up the corner where you are.

There is no control for the borers that work in willows except cutting them out. Cut what out? The borers, if there are only a few—the tree, if it is badly infested.

What's wrong with this Picture?

"Of all the strange devices ever used in tree surgery the least reasonable is probably the drainage pipe one sometimes sees sticking out of a tree, below a concrete filling. The filling needs the drainage often enough but that any one should suppose that such a filling can keep decay out of a tree is a striking commentary on the limitation of human intelligence."

Elbert Peets in "Practical Tree Repair."

Men and Trees

By F. A. Bartlett

Mr. Bartlett deals with a new thought entirely in regard to waterproofing. He is backed up by scientific data covering years of experience.

IF more people understood the real facts underlying the treatment of cavities in trees there would be fewer failures. Because of this lack of knowledge there is bound to be a period of doubtful results in wound treatment until the tree owner and particularly the average tree worker becomes educated to the underlying principle of tree structure and growth and has some knowledge of the stresses and strains to which the tree is exposed.

There is a close relationship between the animal and plant world, and there is a point where it is difficult to distinguish between that which is animal and that which is plant. Man represents the highest type of the animal world and the tree represents the highest type of the plant world. Therefore, it is fitting that there should be a closer relationship between man and trees. Both are living things and perform similar functions such as circulation of vital fluids. Both have breathing organs, both grow old, are subject to diseases and finally die. Man is mobile and can go where he will. The tree must remain always in one position. Man may by word of mouth and action proclaim his ills, but the tree must suffer in silence. To him who understands trees there are unmistakable ways in which the tree may make known its suffering. A dying branch here or there, a yellowing twig, a drooping foliage, a gaping wound, immature leaves, small undeveloped buds, are but a few of the many signs which the tree puts forth to tell us of its wants.

Because the tree and the man are constant companions and because the tree gives freely to man, is it not fitting that man should heed the plaint of the tree when it so plainly calls for help and by some token show his appreciation of its wonderful gifts?

That there is a greater appreciation of trees and a greater desire to do something to protect and preserve them is unquestioned. Many of the simpler ailments are being administered to, but there still remains much to be done, especially in the treatment of wounds which seem to be the least understood and receive generally the least scientific treatment.

Let us consider the tree as a living organism the stem of which is composed of five distinct parts. The pith in the center surrounded by heartwood (the dark colored wood), the sapwood (or light colored wood), the inner bark (or cambium), and the outer layer (or cork tissues).

The pith is of little consequence here. The heartwood is composed of woody cells with thickened walls which contain some water and some air but which have no further function except to add strength to the structure and in dry seasons give up some moisture to the sapwood. The heartwood

of the tree being inactive is subject to attacks of those wood rotting fungii which seldom attack living tissues such as sapwood and cambium.

The sapwood or light wood are active tissues and are composed of innumerable cells the same as the heartwood, and which later in life become heartwood, but with much thinner walls and are the ducts or tubes which convey food producing sap from the roots to the leaves. Sapwood is essential to tree growth, therefore preservation of sapwood is important. The same fungii seldom works in sapwood as in heartwood and therefore should be given specific treatment.

The cambium or inner bark is the most vital part of the tree, contains the most active tissues, and here the actual growth of the tree occurs. New layers of growth are added each year. The outer bark is inactive and of little value except as a protection for the inner bark.

To successfully treat a wound in a tree which penetrates into the heartwood it is necessary to preserve as much as possible of the sapwodo and bark and to so trea thte heartwood with a penetrating antiseptic that decay is retarded and perhaps destroyed. For years it has been considered good practice to attempt to waterproof the interior of a cavity but lately such practice is not considered good form for Plant scientists recognize that there is a varying pressure of sap in trees. Some days there is a distinct outward pressure causing what appears to be leakage of the wound, while on other days there is a distinct negative pressure and a sucking in of moisture. Waterproofing tends to collect sap back of the waterproof material causing an excess of moisture, ideal for fungii to develop. Bearing this in mind, waterproofing now is considered actually harmful and should be avoided. The sapwood should be protected as far as possible from any penetrating material for closed cells prevent a certain amount of sap flow to the leaves, and furthermore if cells are active there is much less danger of fungus infection.

The cambium or inner bark is very delicate and any material which penetrates will be particularly destructive to the growth and often leave a wound much larger than the original.

The dying back of the edges about the treated wound has been for years the most damaging and condemning feature of tree surgery, but thanks to the introduction and development of "Heal Collar," this factor has been eliminated and the killing back has not only been overcome but actual stimulation of the growing tissues has been accomplished. Rapid healing of the cambium is now assured.

As is generally known, concrete has been the most common substance to fill cavities in trees, but concrete has many shortcomings and never has proven ideal or satisfactory because it does not adhere to the cavity walls and does not move in harmony with the tree. It is a foreign substance, cold and unnatural, always damp, producing ideal conditions for wood rotting fungii to work. It is fortunate that materials have been developed which will adhere to cavity walls yet not sufficiently waterproof to restrain the slight flow of sap inward and outward as required by the tree under natural conditions. Vick's NuwuD is a composition of magnesite, asbestos and wood flour which, when treated with a liquid, forms a homogeneous

mass, which is in itself antiseptic and which adheres to the cavity walls, completely closing the orifice, and it readily forms a part of the tree, possessing air and moisture contents nearly equal to the tree itself.

Everyone knows that a tree is in constant motion, sometimes twisting, sometimes bending. That concrete will either bend or twist is untenable, yet NuwuD has htese qualities in addition to its other known advantages, which makes it an ideal filling material.

The scientific world is looking to NuwuD and Heal Collar to solve the Tree Surgery problems and the remarkable results which are being obtained through their use by skilled operators warrant the hearty support which they are receiving.

The gaping wound in trees has always been a problem. William Lawton in 1650 practiced and recommended filling the holes with "well tempered mortar" the same as has been practiced up until the advent of Heal Collar and NuwuD. That the tree whose wound is properly treated shows its appreciation is recognized in the improved condition of the foliage which almost invariably is of a darker green color soon after treatment. Plant scientists tell us that a small amount of magnesium works into the sap flow and acts as a direct food to the leaves which accounts for the improved condition.

That the tree which shows signs of age and decay may be brought back to health and vigor will be welcome news to many of our readers, for failures have been too common and successes too few. Today with new methods and new materials in the hands of skilled workmen Tree Surgery may be considered largely successful with few failures.

WHY PLANT TREES?

Trees add value to property.

Trees protect pavements from the hot sun.

Trees cool the air in summer and radiate warmth in winter.

Trees provide homes for thousands of birds that help man in his fight against injurious insects.

Trees provide homes for many animals that are useful to men for food and clothing and shelter.

Trees help man in fight for better sanitation.

Trees help keep the air for man and lower animals.

Trees supply a large part of all the feul in the world.

Trees give us wood, and wood provides us with building material, furniture, implements, utensils, tools and other useful things in great variety.

Trees provide one of the most striking and permanent forms of beauty.

THE JAPANESE BEETLE

It is only a question of time before the Japanese beetle is generally distributed. It is now well established through New Jersey and eastern Pennsylvania and only last month an outbreak of the beetle was recorded from Mt. Vernon, N. Y.

The beetle is a gregarious feeder, feeding in large numbers upon various host plants, chief of which might be mentioned as the peach, cherry, apple, elm and linden. On apples the beetle has been observed feeding in such swarms that you could not distinguish the apple, it appearing as a round mass of beetles. When the tree was shaken the insects arose in a cloud. Single swarms have been known to fly as far as five miles.

The fact that the Japanese beetle flies will, in our estimation, account for its rapid dissemination. It flies into automobiles and falling to the floor or cushion may be carried for miles. According to Dr. Loren B. Smith of the Japanese Beetle Control Project at Riverton, N. J., the female beetle is capable of depositing eggs at any time during its brief life of six weeks. Right there lies the danger for these beetles distributed by automobiles may start ovipositing in a new community and account for a new infestation. It behooves us all to be on the lookout for this new pest and report any outbreak to the United States Department of Agriculture at Riverton, N. J.

Indian Trail Trees

By Wm. M. Bangall.

Mr. Bagnall has made an extended study of these freaks of nature and what he has to say makes interesting reading.

READERS of stories of the American Indians know how clever the Red Men were in following trails and reading the silent messages left by some traveler who had preceded them. The trails through the dense forest and over the plains were marked much as our highways are marked today, and quite often the markers also conveyed a message to the traveler, telling him where water might be found or something equally important. In many parts of our country are still to be found evidence of the methods used by the Indians to mark their trails and each tribe seems to have had their peculiar method or marker.

Less than a century ago much of the land north of Chicago was the hunting and camping grounds of thousands of Indians. As late as 1816 the northern part of the city now known as Rogers Park was the camping ground of the Patawattomies. Some little distance to the west of the shore of Lake Michigan is a high range of ground which extends northward through Evanston and into Wisconsin. It was along this ridge that the Patawattomie trail extended. Much of this trail had been obliterated by the building of homes and other civic improvements, but it is known to have extended along what is now Ridge Avenue and in parts, Green Bay Road. Following these highways it is not difficult to find the markers the Red Men used.

It is evident that, as were all Indians, the Patawattomies were learned in wood-craft as they used trees to mark their trails to the north. Many of the remaining "trail trees" are of the oak family, probably because the Oak is a hard and long lived tree. In only two cases has the writer found

"Trail Tree" at Winnetka, Illinois, said to be the oldest one now standing.

other species used as markers, one an Ash and one an Elm.

The first of these "trail trees" the writer located in Evanston. It formerly stood a little to the west of Calvary Cemetery, where it is claimed was an Indian village, but has been removed by the Historical Society of that city and placed in one of the parks, mounted on cement blocks, painted with a preservative and appropriately marked with a bronze tablet which gives its history. Other "trail trees" were found in Wilmette and Kenilworth on the grounds of private owners. In Winnetka, farther north, was found a handsome Oak and it is generally believed this is the oldest and best preserved living trail tree. This one has two upright branches. In Glencoe not far from the center of the village is another "trail tree" and this is a fine old Ash.

"Trail Tree" on the grounds of the Exmoor Country Club at Highland Park, Ill., which has since been preserved.

Following the high ridge of land to the north and a little to the northeast one, an Oak, was found in the village of Highland Park growing in the parking along the road. Taking a line to the northwest another marker was found in rear of some houses on the south side of the street leading to the entrance to the Exmoor Country Club. On the grounds of the Club are to be found two very fine trees and one is especially interesting because in this case one of the large lower limbs was bent or broken instead of the trunk as in most cases. The other, which is highly prized by the members of the Club, has been preserved and nourished and is now showing signs of renewed life and beauty.

A few miles farther north, to the west of Fort Sheridan, in what is probably the finest stand of virgin timber in this locality, are to be found two fine "trail trees". One of them must have grown considerably since it was first bent or broken as the peculiar formation is about fifteen feet from the ground.

The general formation of these trees is much the same, in some cases resembling the body of an animal. They appear to have been bent or broken near the ground line when just a sapling and main leader and all branches but one, two or three cut off, allowing these to become the top or head.

"Trail Tree" near Ft. Sheridan, Ill. Bend or break about fifteen feet from the ground.

It is rather sad to note that many of these trees are in a weakened condition due to the decay that is eating away the structural strength and threatening to destroy these monuments of a noble race. The question naturally arises, "Can these trees be preserved?" The writer can answer in the affirmative, as witness the one on the grounds of the Exmoor Country Club.

It is generally conceded that a tree will live just so long as it is in a healthy and vigorous condition and is not attacked by fungus or insect enemies. If decay is present it must be removed, properly braced if necessary, the cambium around the cavities protected, and the cavity filled with an elastic filler that will give with the motion of the tree. In some of these trail trees concrete fillings have been used but in every case the writer examined, the concrete had either cracked or shrunk away from the wood, thus allowing the moisture to enter the cavity and the decay was again at work. These trees must be nourished or fed with a material that will last through the growing sea-

son. This stimulates and invigorates growth and makes the tree healthy so that it will withstand more readily the attacks of enemies, such as fungi and insects.

At one time a very fine old "trail tree" stood near the village of Glencoe but through the ravages of decay this has been entirely destroyed. It is to be hoped that the interest of the Historical Societies and other residents may be awakened so that these living memorials of a vanished race may be preserved for future generations.

Book Review

AMERICAN FRUITS

By Samuel Fraser, M. S. in Agr.

This book is the outcome of 35 years' experience in working with plants. It is a standard work and an authoritative guide. It outlines what to do and tells why and when. It is of equal value to the amateur, the student in high school or college, those engaged in this work for their livelihood, and to the public who wish to be informed.

The writer's experience in Europe and America—on the farm, in the orchard and nursery and as a teacher and research specialist in the problems of plant breeding, the commercial production of fruits and the problems of transportation and distribution of fruits furnish a background such as few men possess and render him peculiarly fit to prepare a book of this kind.

For over 20 years the services of Samuel Fraser have been eagerly sought as a speaker before horticultural societies and as an advisor in practical matters concerning the production of fruits, its harvesting, packing, transportation and distribution. This book answers some of the questions with which he has been confronted and places the information in such form that it has pedagogical value. No other book covers the field from the practical standpoint.

In the first 30 chapters the general principles of fruit growing are considered with particular regard to the apple. Most of these apply to other fruits. All other important fruits are treated specifically and details in regard to management are given.

The close contact the writer has with the practical details of his subject, the sympathetic approach and easy manner of expression leads the reader to a better understanding and a higher appreciation of the wonderful plants which furnish our American Fruits.

LOCUST LEAF MINER

The Locust Leaf Miner continues its devastating work to the foliage of the locust trees on Long Island. The trees appear to be scorched and in many cases the leaves fall.

The Third Annual Shade Tree Convention

By C. C. Lawrence

There is always a demand to know what happened at the Shade Tree Conference, and Mr. Lawrence has told briefly of the occurrences there.

THE Third Annual Shade Tree Convention was held in Philadelphia, August second and third, with headquarters at the Bellevue-Stratford Hotel. From all angles it was the best convention held yet, and great credit is due the local committee, of which Mr. Albert F. W. Vick, Pennsylvania representative of The F. A. Bartlett Tree Expert Company, was chairman.

After registration of the sixty odd delegates, busses were supplied, holding thirty each, and a start was made for Fairmont Park. Mr. Baxter, the forester of Fairmont Park, was at the megaphone pointing out interesting things in the park. Of interest from a shade tree point of view was the infestation of tussock moth, which assumed serious proportions. Fortunately, the Park is well equipped with spray outfits to handle this emergency. The next stop was to observe some trees that had been successfully treated for gas injury, treatment consisting of stoppage of the leak, and boring holes in the soil to liberate the excess gas, and filling the holes with lime, followed by a subsequent feeding.

At the Narberth Tennis Club, Leaf and Twig Blight of sycamore was observed. It was suggested that an investigation be started as to the best means of control of this disease. Next in order was a stop to examine some sick beeches. Dr. Rankin of the New York State Department of Agriculture was of the opinion that this trouble was due to a lack of iron in the soil resulting in a chlorosis of the leaf. At the Atwater Kent Estate some NuwuD fillings were observed in a paper mulberry. The remarkable feature of this work was the healing which was taking place due to heal collar in an otherwise slowly healing tree. At the Dr. G. Leslie Davis estate some cement fillings were observed which were healing satisfactorily. At the Haverford School some oaks were observed which had been treated for Golden Oak Scale, treatment consisting of spraying the trees and feeding them heavily. A very interesting stop was made at the arboretum of Mr. W. Hinkle Smith, where rare and unfamiliar trees were looked at. Lunch was then served at the Hotel Dupont at Wilmington, Delaware. On the way to Wilmington four of the largest sassafras trees in existence were pointed out. An old oak was observed at the estate of Mr. H. Fletcher Brown which has been continuously cared for for the past eight years. It had been sprayed, fertilized, and pruned during this period and showed what could be done to keep an old tree alive that had started to decline. The next stop was a decided treat, taking in the arboretum and greenhouses of Mr. P. S. du Pont. The greenhouses are probably as fine as any in the country. A feature here were the azalia trees. After an organ

recital, start was made for Philadelphia, where dinner was served at Boothby's. After dinner speeches were in order and given by Mr. Stewart of the Pennsylvania Forest Service, Mr. Mulford, Horticulturist of the United States Department of Agriculture, and Dr. E. P. Felt, New York State Entomologist. Dr. Felt gave an excellent paper on "Municipal Shade Tree Problems and the Professional Tree Worker."

The following morning the party proceeded to Chestnut Hill, examining on the way some beech canker on the estate of John Gilpin. This tree was subjected to a drying out of the roots due to its position on a knoll and excessively good drainage, the canker being more or less secondary. The tree would have been helped exceedingly by a good leaf mulch. Next to the S. P. Rotan estate where mulberry and beech diseases were examined. It was interesting to note here an apple orchard of large trees which had been successfully transplanted. The E. T. Stotesbury estate, one of the finest in the country, was next in order. Mr. Deschamps, the superintendent, took the members of the convention through the spacious gardens and into the mansion where refreshing iced tea, coffee and orangeade were served. Sail was then set for the Hotel Trent at Trenton, where a delicious luncheon was enjoyed by all. C. J. Wilber, New Jersey State Forester, made a brief address and Paul Davey read a paper on research. The Resolutions Committee recommended that research be taken up regarding trees and shrubs suitable for roadside planting; that a better term be substituted for "tree surgery"; and that thanks be extended to owners who had permitted inspection of their estates. Prof. J. Franklin Collins spoke on "Case Records," presenting each member with a mimeographed copy of a proposed record sheet with which to standardize information in connection with tree treatment involving pruning and cavity work.

The Recommendations Committee made the following report: That a committee of five report at the next meeting on the formation of a permanent organization. That Dr. E. P. Felt and W. O. Filley serve as president and secretary respectively for the coming year. That next year's conference be held in Washington, D. C., and that of 1928 in Cleveland, Ohio.

The Delegates in front of Mr. Pierre du Pont's Conservatory.

In the afternoon inspection was made of the Harris Hammond estate at Bordentown, formerly the old Bonaparte place. Here numerous examples of the NuwuD filling were seen. The collection of box here ranks with the finest in the country and represents a collection from all parts of New Jersey, Pennsylvania and Delaware. Next in order was a visit to the Japanese Beetle Project at Riverton, N. J., where the work of the station was explained by Dr. L. B. Smith. Mr. King spoke on the parasites, the exterminating value of which it is too early to predict. Visit was then made to sprayed and unsprayed orchards and to Moorestown, where individuals had had their trees sprayed. Coated arsenate of lead was used with great success. It is lead arsenate in paste form in which every particle has been coated by an insoluble soap.

The busses then returned to Camden, crosing the new Delaware bridge. The party disbanded at Cynwyd at the home of Mr. Vick, where an informal buffet supper was served. The conference was indeed a success and indicated the widespread interest in all matters pertaining to trees.

OUR "DRESSED UP" TREES

To be in keeping with our well groomed homes, lawns, driveways, paths, and ornamental plantings, should not our trees be groomed in company with their "Dressed Up" companions?

How much more satisfying to look upon a group of healthy vigorous trees, rather than to look upon trees in leaf with many dead limbs protruding above and through the foliage.

Our large Norway spruce trees, being heavy feeders, frequently have their limbs die back for want of nourishment. Do they not look better when these dead tips are pruned and a liberal feeding of Tree Food has been given them to promote a healthy growth with color to the needles? The same is true of our large White pines with their horizontal limbs silhouetted against the skyline in a very Japanese like effect. They too give a very neat appearance when all the broken stubs and limbs have been removed by pruning.

With the aid of careful pruning vistas may be opened up between trees, where they are too closely planted, and a view across a neighboring lake or valley can be enjoyed. To have a vista well cut, with no unsightly stubs protruding, and with the remaining limbs blended perfectly as though natural, requires pruning of the highest quality. A workman on such a job needs a good eye as well as a sharp saw.

Many are the hours spent raking and carrying away small limbs blown down on our well kept lawns from trees which require some pruning attention. Not only is the litter in the trees and on the lawns unsightly, but there is always the danger that large dead and decayed limbs may break off and cause both personal and property damage.

Let's keep our trees well groomed and enjoy their "Dressed Up" company.

Timely Hints

Cut out the cankered areas in your trees now.

Have the cavities in your trees treated.

Wounds in trees should be covered to prevent the entrance of fungus spores.

Watch shade trees, especially Elms, for the work of the Leopard Moth.

Dig out the Sugar Maple Borer and Carpenter Worm.

If you have not fertilized your trees, do so now that they may receive the benefit of the fertilizer during their growing season.

Cut out and burn dying Hickory trees for they are the breeding place for the Hickory Bark Beetle.

Cut out and burn dying Oak trees for they too are the breeding place of the Two-lined Chestnut Borer.

The ravages of the Bronze Birch Borer may be retarded by fertilizing your Birch trees and applying plenty of water.

Water and plant food will keep your trees in a healthy and vigorous condition.

Cut away dead and dying branches for they spread diseases and insects.

Protect your big trees and your feature trees from lightning. TREE TALK will be glad to supply up-to-date information on this subject.

Brace all trees which show a tendency to split down.

Do not allow cement to be put in your trees. There are other materials far more effective.

Do not neglect the cavities in your trees. Each year they grow larger and the structure of your trees becomes weaker and weaker.

Open cavities are but a make-shift, and never prove effective. Have them filled with an antiseptic filler which will arrest decay and exclude water and air.

The Care of Locust Trees

By C. F. Greeves-Carpenter

Mr. Carpenter is a newcomer to Tree Talk *and as such we welcome him. His name, however, is familiar to readers of horticultural papers.*

THE dying of limbs in Locust trees is a very common sight and is due in the majority of cases to the work of borers: principally to that of the Locust Borer, Cyllene robiniae, Forst. During September the adult beetles may easily be seen on the trees, owing to their bright velvet and gold bodies. After mating, the females lay their eggs on the bark, and these soon hatch into borers which immediately commence to burrow. During fall the borers are dormant, and in the spring they recommence their activities by boring into the sapwood in an upward direction from their point of entrance. The bark soon commences to swell where they have been working, and the trees become disfigured by porous swellings caused in their efforts to heal over the injuries.

Another injurious borer working in Locusts is the Locust Twig Borer, a pale white caterpillar about one-half inch long with a dark brown head. The insects bore into the smaller twigs, giving rise to a somewhat irregu-

Black Locust Plantation Injured by Locust Borer.
Photo by W. O. Filley.

lar thickened growth. On reaching maturity in the latter part of September or early in October, they leave the stems through channels bored to the surface, descend the trunks in order to spin cocoons in the dry leaves or other suitable debris in which they rapidly change to pupae and later to adult moths.

Locust Borer Injury to Black Locust.

In order to obtain some control of these pests, the dead limbs of the affected trees should be cut off during the early part of September and *burned immediately*. It is then very advisable to feed the trees with a commercial tree food. A preventive wash should be made up of one pound of hard soap which should be dissolved in a gallon of hot water, one-half pint of crude carbolic acid should then be added as well as two ounces of paris green and the solution should be thickened with lime, and allowed to stand over night. The wash should then be painted on the limbs and trunks of the trees. This, of course, is quite difficult of accomplishment, and it is very doubtful if the ordinary gardener could undertake to do this work. If the solution were not made too thick it could be sprayed on the trees with a power sprayer through a very coarse nozzle. The application of this preventive wash so soon as the dead limbs are cut off does much to ward off a reinfestation.

Locust Borer Adults on Golden Rod.
Courtesy of the Connecticut Agricultural Experiment Station.

The Asiatic Beetle has made its appearance at Jericho, L. I., on the estate of Judge Gary and in Mt. Vernon, N. Y. It is closely akin to the beetle Autoserica japonica Motsch, which has also been observed in Mt. Vernon, flying and feeding at nights. The Asiatic beetle is particularly destructive to the roots of grasses, resembling the Japanese beetle in this respect.

Tree Surgery That Causes Admiration

Hickory trees have been "blacklisted" by tree surgeons as not responding to cavity treatment when filled with concrete, but with Vick's NuwuD and Bartlett Heal Collar remarkable healings invariably occur over the filling. This photograph was taken one year after the treatment. Note the remarkable growth not only on the sides of the filling, but above and below as well.

Office of
JOHN GOLDEN
HUDSON THEATRE, NEW YORK

January 26, 1926.

The F. A. Bartlett Tree Expert Co.,
Stamford, Conn.

Gentlemen:

In reply to your letter requesting an expression of opinion as to the work which you have done for me for the past two years, would say that to the best of my knowledge the work has been very satisfactory. The cavity work has been particularly satisfactory as evidenced by the remarkable healing along the edges. I believe this has been due to what you term "heal collar."

The spraying also has kept my trees in good foliage throughout the year.

Yours very truly,

(Signed) JOHN GOLDEN

Producer of: *Turn to the Right, Lightnin', Three Wise Fools, The First Year, Dear Me, Thank-U, Spite Corner, The Serpent's Tooth, Seventh Heaven, Wages for Wives, Pigs, The Wisdom Tooth,* Etc.

Pecan scab is a disease of considerable economic importance and wide distribution throughout the Southeastern states.

The disease is caused by a parasitic fungus which attacks nuts, growing twigs, and leaves of susceptible varieties. Some injury is done to all parts attacked, but the greatest damage is to the nuts.

Of the more popular varieties growing within the region of the most frequent summer rains, a narrow belt along the Gulf Coast about fifty miles wide, extending from Baton Rouge, La., to Tallahassee, Fla., more than half can be classed as very susceptible.

Large top-worked, San Saba pecan tree at San Saba, Texas.

Extensive experiments on the control of the disease have been carried on for a number of years. The recent experimental work has demonstrated that pecan scab can be controlled much more easily than the results of their earlier experiments indicated.

The control measure recommended consists of spraying at suitable times with Bordeaux mixture or lime-sulphur solution. As a supplementary measure, orchard sanitation is recommended.

SAVING THE SHADE TREES

Park Commissioner Benninger of Queens has set a good precedent in refusing permission to move a house at the cost of cutting down or injuring a score of linden and maples that have stood for thirty years in a street in Woodhaven. The owner of the building took the case to the Supreme Court. Justice Lazansky decided that the Park Commissioner could not be compelled to issue the permit, that his refusal was not an abuse of discretion.

Such rulings are encouraging for city forestation. It should be an established policy that not a shade tree is to be sacrificed unnecessarily. In the case decided the householder suffers some hardship, but it is out-weighed by the community interest. It is well to put a heavy burden of proof on the plaintiff who would destroy a tree.

Plants Valuable Because of the Autumn Coloration of Leaves

This list consists of trees and shrubs which brighten the landscape at the end of the growing season. No reference in this list is made to trees and shrubs whose leaves merely turn brown in the fall. Many of these types can be used for specimens and accent purposes.

EARLY

Acer Negundo
Box elder

Acer rubrum
Red Maple

Acer saccharum
Sugar Maple

Liquidambar styraciflua
Sweet Gum

Sassafras Officinalis
Common Sassafras

Acer rubrum
Red Maple

Rhus typhina
Staghorn Sumac

Betula lutea
Yellow Birch

MEDIUM

Ampelopsis quinquefolia
Virginia Creeper

Quercus rubra
Red Oak

Vaccinium corymbosum
Huckleberry

Nyssa sylvatica
Sour Gum

Berberis Thunbergii
Thunberg's barberry

Rhus aromatica
Fragrant Sumac

Fraxinus Americana
White Ash

Viburnum acerifolium
Maple-leaved Viburnum

Viburnum dentatum
Arrow-wood

LATE

Quercus coccinea
Scarlet Oak

Euonymus Europaeus
European Spindle Tree

Mahonia aquifolium
Oregon Grape

Oxydendrum arboreum
Sourwood

Ginkgo biloba
Maidenhair Tree

Cladrastis lutea
Yellow-wood

Euonymus alatus
Winged Spindle Tree

Cornus florida
White-flowering Dogwood

Forsythia viridissima
Dark Green Forsythia

Hamamelis Virginiana
Witch Hazel

GOOD BOOKS ABOUT TREES

For the convenience of TREE TALK readers we have arranged to furnish the leading books relating to trees, their planting, care, culture and preservation, at regular publishers' price. Any book listed below will be sent postpaid on receipt of price.

TREES IN WINTER—By Prof. Blakeslee	$ 3.50
PRACTICAL TREE REPAIR—By Prof. Elbert Peets	2.50
HANDBOOK OF THE TREES—Romeyn B. Hough—*Buckram*	8.00
HANDBOOK OF THE TREES—Romeyn B. Hough—*Half Morocco*	10.00
THE TREE GUIDE—Julia Ellen Rogers—*Cloth*	1.25
THE TREE GUIDE—Julia Ellen Rogers—*Leather*	1.50
THE CARE OF TREES IN LAWN, STREET AND PARK—By Prof. B. E. Fernow	2.25
GETTING ACQUAINTED WITH THE TREES—By John Horace McFarland	1.75
PRODUCTIVE ORCHARDING—By Fred C. Sears	2.50
PRINCIPLES AND PRACTICE OF PRUNING—By M. G. Kains	2.50
ECONOMIC ENTOMOLOGY—By Prof. J. B. Smith	2.50
INSECT PESTS OF FARM, GARDEN AND ORCHARD—By E. D. Sanderson	4.50
OUR NORTHERN SHRUBS AND HOW TO IDENTIFY THEM—By Harriet Keeler	3.00
OUR NATIVE TREES AND HOW TO IDENTIFY THEM—By Harriet Keeler	3.00
MANUAL OF TREE AND SHRUB INSECTS—By Dr. E. P. Felt	3.50
THE PRINCIPLES OF FRUIT GROWING—By Prof. Bailey	2.50
OUR TREES: HOW TO KNOW THEM—Arthur I. Emerson and Clarence Weed	3.50
THE TRAINING OF A FORESTER—By Gifford Pinchot	1.50
ELEMENTS OF FORESTRY—By Prof. F. F. Moon	3.50
STUDIES OF TREES—By J. J. Levison	2.00
GARDEN TREES AND SHRUBS—By Walter P. Wright	7.50
FIELD BOOK OF AMERICAN TREES AND SHRUBS—By Frank E. Lutz	3.50
OUR VANISHING FORESTS—By Arthur Newton Pack	1.50
THE FARM WOODLOT—By E. G. Cheyney and J. P. Wentling	3.00
TREES AS GOOD CITIZENS—By Chas. Lathrop Pack	2.00
SCHOOL BOOK OF FORESTRY—By Chas. Lathrop Pack	1.00
NUT GROWING—By Robert T. Morris	2.50
MANUAL OF TREE DISEASES—By W. Howard Rankin, A.B., Ph.D.	3.25

When ordering write name and address plainly. Remittance may be made by registered letter or Post Office Money Order.

Address All Orders to TREE TALK, Stamford, Connecticut

"THE BARTLETT WAY"

Is the Blazed Trail of Scientific Tree Surgery

THE F. A. BARTLETT TREE EXPERT COMPANY is the *first* national organization to unqualifiedly GUARANTEE THEIR CAVITY WORK.

THE F. A. BARTLETT TREE EXPERT COMPANY is the *first* company to adopt practical LIGHTNING PROTECTION for trees.

BARTLETT ASSOCIATES *first* used STEEL CABLES for strengthening weak crotches in trees.

BARTLETT ASSOCIATES *first* studied the problem of tree malnutrition and PERFECTED A BALANCED RATION which could be easily applied.

BARTLETT ASSOCIATES *first* **standardized the cost of spraying** and printed a *schedule* of charges.

BARTLETT ASSOCIATES were the *first* to perfect and use POWER MACHINERY.

A BARTLETT ASSOCIATE was the *first* to perfect a practical FLEXIBLE FILLER WHICH ARRESTS DECAY IN THE BACK OF THE CAVITY, sticks to the cavity wall, completely excluding outside moisture, sways with the tree, has a specific gravity and potential strength about that of the average timber, and can be safely and easily applied any month in the year—VICK'S NUWUD.

MR. BARTLETT himself perfected the BARTLETT HEAL COLLAR. *The first human surgery actually applied to trees.* This wonderfully effective method of treating the most tender portions of trees has removed the last objection of the skeptic as it *insures rapid and uniform growth around the entire edge of the cavity* and (this growth can be started in mid or late summer as well as in early spring.)

Since the *beginning* of commercial tree surgery, the **BARTLETT ASSOCIATES** have been the LEADERS IN SCIENTIFIC DEVELOPMENT OF THE ART. Power tools and flexible filler, like cables and tree foods, have come to stay. Within a few years all reputable tree men will be using more or less passable imitations. Over five years of satisfactory service is the record of Vick's NuwuD. Twenty years of scientific research and progress in practical tree preservation is the record of the **BARTLETT ASSOCIATES**, who are constantly working to save the health and structure of valuable trees and bring the cost within the means of the average tree owner.

The F. A. Bartlett Tree Expert Company

HOME OFFICE, STAMFORD, CONN.

810 Tremont Building, Boston, Mass. 708 Harrison Building, Philadelphia, Pa.
Wenham, Mass. Danbury, Conn. White Plains, New Rochelle, N. Y.
Westbury, L. I. Morristown, N. J. Lansdowne, Pa.
7347 North Paulina St., Chicago, Ill.